REMARKS

Claims 3-7 and 9-13 are pending. Claims 3-4, 6 and 9 are amended and claims 1-2, 8 and 14-17 are canceled with this response. Reconsideration of the application in light of the above amendments and the following remarks is respectfully requested.

I. REJECTION OF CLAIMS 1, 4-5 AND 10 UNDER 35 U.S.C. § 102(e)

Claims 1, 4-5 and 10 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Publication No. 2003/0176073 (Ying et al.). Claim 1 has been amended to include the limitations of claim 3, which was considered not to be anticipated by Ying et al. in the Office Action. Since claim 3 was, however, rejected as being obvious over Ying et al. in view of Moise et al., a discussion of the non-obvious of amended claim 1 is provided below. Withdrawal of the rejection is respectfully requested for at least the following reasons.

i. Ying et al. and Moise et al. do not teach a PZT etch with BCl3 and Cl2 in a range of ratios from 1:4 to 10:1, respectively, as recited in claims 1 and 6, and it would not be obvious to obtain such ratios by routine experimentation because the recited ratio range is not a result-effective variable.

As admitted in the Office Action, neither Ying et al. nor Moise et al. teach the gas ratios of BCl3 and Cl2 from 1:4 to 10:1 as claimed. The Office Action, however, asserted that it would have been obvious to determine gas ratios from routine experimentation. Applicants respectfully disagree. As set forth in MPEP § 2144.05 (II)(B), "a particular parameter must first be recognized as a result-effective variable, *i.e.*, a variable that achieves a recognized result, before the determination of the optimum or workable range of said variable might be characterized as routine experimentation." (*Citing* In re Antonie, 195 USPQ 6 (CCPA 1977)). It is respectfully submitted that the recited gas ratio range of BCl3 and Cl2 is not a result-effective variable, as will be further appreciated below.

Ying et al. disclose that adding nitrogen to the Cl2, O2 and CHF3 gas combination may alter the capacitor stack sidewall profile (*see, e.g.*, [0029]), however, ***Ying et al. do not provide any mention of BCl3 and Cl2 for etching the ferroelectric dielectric layer***. Further, Moise et al. teach use of Cl2 + CF4 + Ar + O2 to etch the PZT layer (*see, e.g.*, Col. 17, line 67 – Col. 18, line 59), and in a chart in Col. 19 briefly state that Cl2 can be substituted with BCl3 or may have BCl3 added thereto. (*See, e.g.*, Col. 19, lines 1-12). However, ***the Moise et al. reference provides no discussion of the impact of a combination of BCl3 and Cl2 and provides no indication that the ratios are relevant in any fashion, and certainly provides no hint that a ratio range may impact the sidewall profile of the capacitor stack.*** Clearly then, the cited ratio range of the present invention is not recognized by the cited art as a result-effective variable.

Since the claimed gas ratio range of claims 1 and 6 is not a result-effective variable, it is respectfully submitted that the assertion that it would have been obvious to obtain such a ratio range by routine experimentation is incorrect. Therefore claims 1 and 6, and the depending claims associated therewith, respectively, are non-obvious over the cited art. Accordingly, withdrawal of the rejection is respectfully requested.

ii. Ying et al. do not teach etching first and second metal layers and the ferroelectric layer to form sidewalls having a sidewall angle between 78° and 88°, as recited in claim 10.

Claim 10 is directed to a method of forming a ferroelectric memory capacitor that comprises forming a capacitor stack composed first and second metal layers with a ferroelectric layer sandwiched therebetween. The method further comprises etching the second metal layer, the ferroelectric layer and the first metal layer using a plasma process ***to form sidewalls having an angle between 78° and 88°.*** Ying et al. do not teach this feature, and thus do not anticipate the invention of claim 10. Accordingly, withdrawal of the rejection is respectfully requested.

II. REJECTION OF CLAIMS 2-3, 6-9 AND 11-13 UNDER 35 U.S.C. § 103(a)

Claims 2-3, 6-9 and 11-13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ying et al. in view of Moise et al. (U.S. Patent No. 6,211,035. As set forth above, claims 3 and 8 have been canceled, with their limitations incorporated into claims 1 and 6, respectively, and claims 1 and 6 are non-obvious over the cited art for the reasons set forth above.

In addition, claims 11-13 depend upon claim 10, which as highlighted above is not anticipated by Ying et al. Further, Moise et al. do not remedy the deficiency in Ying et al. because the secondary reference does not teach a sidewall profile range as claimed. Therefore claims 11-13 are non-obvious over the cited art for at least the above reasons. Accordingly, withdrawal of the rejection is respectfully requested.

III. CONCLUSION

For at least the above reasons, the claims currently under consideration are believed to be in condition for allowance.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Should any fees be due as a result of the filing of this response, the Commissioner is hereby authorized to charge the Deposit Account Number 20-0668, TI-34580.

Respectfully submitted,
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CERTIFICATE OF MAILING (37 CFR 1.8a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendment, Assistant Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: January 6, 2006

Christine Gillroy

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